User's manual

USB MIDI Breath & Bite Controller (BBC)

June 2014, Rev 1.0

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For the most up to date information, visit the support pages at our web site
http://www.tecontrol.se
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2 REVISIONS

Rev.	Date	Major changes
1.0	1-June-2014	First issue

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3 INTRODUCTION

The TEControl team is very happy to be able to serve the community and fill the gap left by Yamaha in the world of breath controllers. We like to think that we took over where Yamaha left, providing the MIDI community with not only a replacement but taking it to a new level corresponding to developments made in the MIDI world during the last couple of years.

With sample libraries getting better and better, physical modeling advancing to incredible realism, the need for good controllers is obvious. With the introduction of the USB MIDI Breath & Bite Controller (BBC) we are now able to provide you with dual control: breath controller and in addition bite (lip pressure) controller, the latter until now found only on more expensive wind controllers.

To quickly get an overview of the past and present breath and wind controllers, we recommend checking out:

http://www.patchmanmusic.com/WindControllerFAQ.html.

It contains a very good description of Breath Controllers in general together with available devices.

All this said, we encourage suggestions for improvements and new products.

The TEControl team

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4 OVERVIEW

The BBC is designed for musicians who want to add extreme expression and realism to their performance. It features two sensors and can be thought of as two independent MIDI controllers which generate continuous MIDI data corresponding to the amount of breath and bite pressures applied. The Breath Controller uses the built-in piezoelectric pressure transducer as input and the Bite Controller uses the integrated bite sensor (located on the lower side of the mouthpiece) to measure the force applied through bite or lip pressure. The Bite Sensor is sensitive to moisture and can be damaged if exposed to excessive humidity. Therefore it is protected by a thin layer of food grade silicone which will prevent any humidity from reaching the sensor. Please, take care not to displace or damage the silicone cover. The mouthpiece bleed adjustment is improved with increased flow and more precise adjustment.

The BBC can also send pitch bend and aftertouch. While the aftertouch is straightforward, the pitch bend is due to the nature of the sensors implemented as positive or negative action. We have, however, also included a mode where the full function is available and can be tailored to usability with the sensitivity curve.

A unique feature of the BBC is its ability to shape the response from sensor input to MIDI output. It also provides a monitor function simplifying the sensitivity adjustment. This way you can optimize the sensitivity to your own style of playing. The attack and decay filter controls can be set from 0 to several seconds. They allow you to make very smooth swells.

With the downloadable Configuration Utility you can configure all the parameters described above as well as save and load your own presets.

Signal processing algorithms guarantee full resolution over the configured sensor input ranges. The event-driven MIDI output streaming, filters out redundant data not to overflow your MIDI input and assures lowest latency. MIDI messages are transmitted only when input changes cause a change in the MIDI output value.

The BBC does not require installation of drivers or software. It will work with the default settings straight out of the box with both Windows and Mac OS.

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5 GETTING STARTED

5.1 Installation

Connect the BBC to a USB port on your computer, which will detect it automatically and configure the operating system's built-in USB-MIDI class driver. The BBC will show as "**Breath Controller X.Y-ZZZZZZZZ"** in your applications, where **X.Y** is the firmware version and **ZZZZZZZZ** is the unique serial number. It is fully functional with the default settings.

5.2 Default settings

The BBC comes pre-configured with default settings and will work straight-out-of-the box. The default settings are as follows:

- *Linear sensitivity*
- *Input and output ranges set to maximum*
- *Attack and decay filters disabled*
- *MIDI channel 1*
- *MIDI Message set to Control Change*
- *CC# 2 [breath control] and CC#1 [modulation wheel]*

To change the settings, download version 3.0 or later of the Breath Controller Configuration Utility from www.tecontrol.se, unzip it and run the installer.

For future enhancements, firmware upgrades may be made available.

5.3 Configuration Utility

When started, the Configuration Utility will check for a connected Breath Controller. If not found, the lower portion of the window will display an error message "*Error: controller not found. Please check "Select Controller" under the File Menu*". This message could indicate that it is the first time you use your BBC or that there is no BBC connected to your computer.

First time use; In the menu "File/Select controller", select the correct device.

It has been reported to us that on some Windows installations, the operating system may report the Breath Controller as "USB Audio Device" instead of "Breath Controller X.Y-ZZZZZZZZ". For those rare instances, please use "File->Select controller" to select the correct device.

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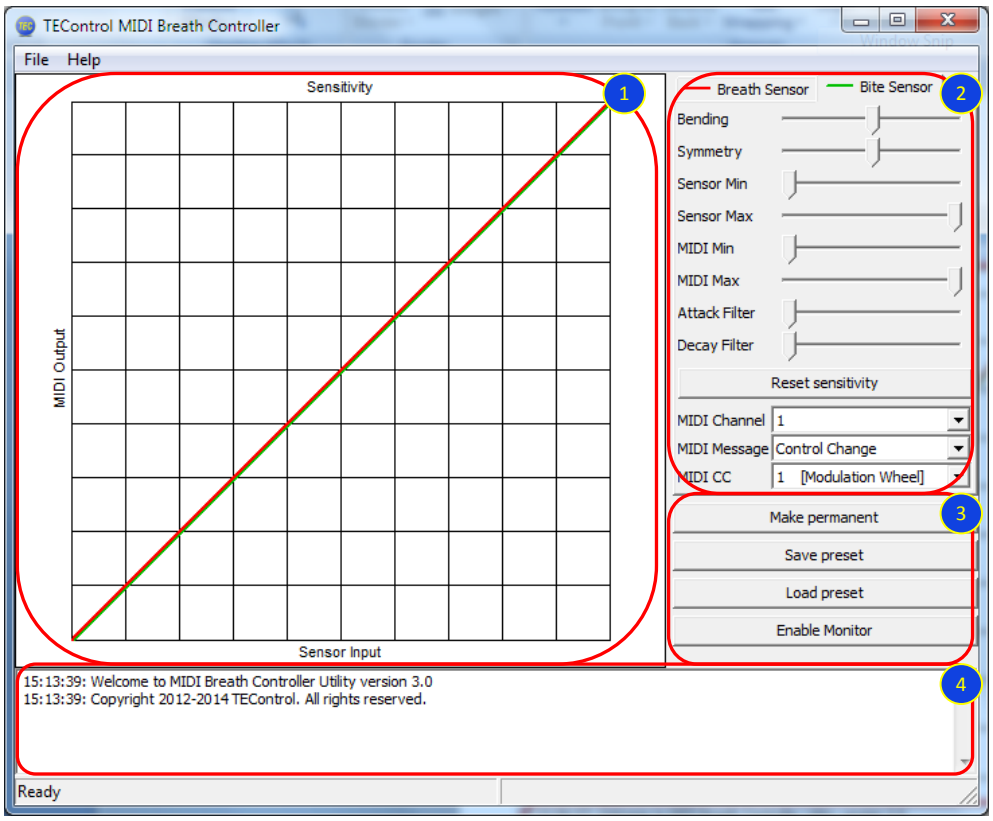

Figure 1 - Default settings

1 The left part of the window shows the sensitivity curves of both sensors simultaneously.

2 The two controllers are configured independently and are selected by clicking the respective tab located on the right side of the window.

3 The **Configuration Utility** includes the possibilities to **Save** and **Load** as many presets as you like. This is very convenient since each sample library, VST instrument or keyboard/synthesizer might require different settings. The **Save preset** button lets you save the settings of both sensors to a file location and file name of your choice. The filename extension ".tec" is added by default.
Here you can also enable/disable the sensor input monitor function.

4 Located at the bottom of the window is a message window which reports the response of your actions as well as potential error messages. Please, keep an eye on the messages displayed there to detect any problems.

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In your DAW, player etc... the BBC must be selected as a MIDI input device in order to work. The BBC also appears in the list of MIDI output devices but should **NOT** be selected since it is used by the Configuration Utility.

In your DAW, you must also configure the MIDI input of the track you are playing or recording to *"MIDI omni", "All MIDI inputs"* or similar function that configures the track to responds to all MIDI controllers. This is necessary to allow you to control the instrument from both keyboard and BBC.

WARNING!!!

Due to the nature of the BBC ***(or any other MIDI controller) the CC will be left at zero value when you release the pressure (i.e. stop blowing or biting). Depending on the CC you are controlling you might not hear any sound without blowing.***

You might get into a deadlock if e.g. you first use the BBC ***with CC 7 (volume), stop blowing will leave your instrument volume at zero value, change the CC to e.g. 11 (expression). No sound will be heard since the CC 7 - volume is still at zero.***

Please, keep this in mind before contacting support.

To solve the problem either restart your sample player or try the following:

- Select the CC that might be left at zero.
- While applying pressure change the CC to e.g. 1 (mod wheel)
- Repeat if you have more CCs left at zero

5.4 How to program

The 8 sliders of the **Configuration Utility** let you tailor the response from input pressure to MIDI CC value. Select sensor by clicking the appropriate tab located above the sliders.

With the **Bending** and **Symmetry** sliders you can change the linear response to various shapes.

The **Input Min** sets the threshold of the input pressure i.e. any pressure below the threshold will not cause any change in the output CC value.

The **Input Max** can be tailored to how hard you want to blow to achieve max CC value (set by **Output Max**).

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With the **Output Min** you can set the output CC value to be used for pressures below the input threshold. This is useful if you don't want the CC value to drop to zero.

The **Output Max** sets the maximum CC value to be sent.

The **Reset sensitivity** button resets the sensitivity to linear with full input and output ranges.

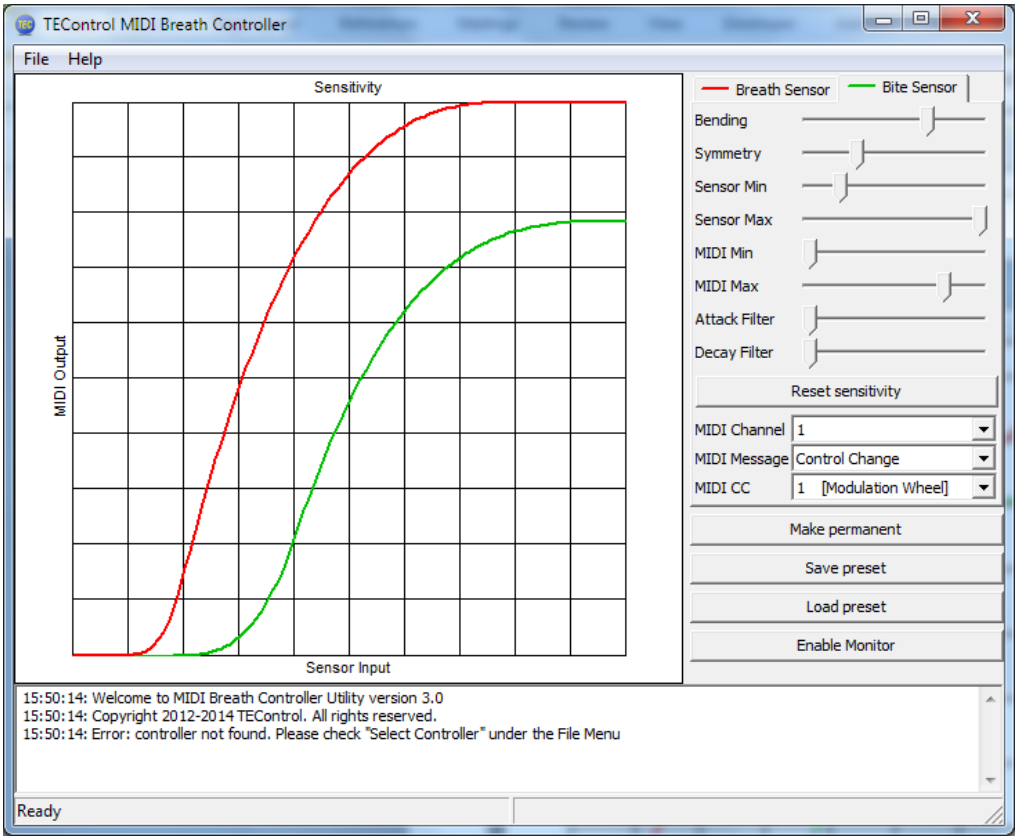

Figure 2 - Sensitivity settings

With the **MIDI Channel** drop-down list you set the MIDI channel to be used for the transmission of the MIDI message.

The **MIDI CC** drop-down list lets you select the actual controller to be used e.g. *CC1 [Modulation Wheel]*, *CC2 [Breath Control]* etc... See annex for a complete list. The **MIDI CC** is effective only when *Control Change* is selected in the **MIDI Message** drop-down list.

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In the **MIDI Message** drop-down list you can in addition to the above mentioned *Control Change* also select *Aftertouch, Pitch Bend Up*, *Pitch Bend Down* and *Pitch Bend Both*. Note that when either *Aftertouch* or any of the *Pitch Bend* options are selected the **MIDI CC** drop down is grayed out.

Aftertouch is what the MIDI specification refers to as channel pressure.

Due to the nature of the sensors used, *Pitch Bend* can only be used in one direction; *Pitch Bend Up* or *Pitch Bend Down*. We have, however, also included a *Pitch Bend Both* mode, where the full function is available and can be tailored to usability with the sensitivity curve.

The Attack Filter and Decay Filter sliders let you set the respective time constants individually. Setting the sliders fully left give you the fastest response (filter disabled) and setting them fully right allows time constants of several seconds. This is very useful for semi-automatic swells.

All the above changes to the settings take immediate effect but are lost when the computer is powered off or the BBC is removed from the computer. To store you settings permanently in the BBC, use the **Make permanent** button. This means your settings are remembered when the Breath controller is unpowered. You can now move it to another host with your favorite settings intact. Every time you use the **Make permanent** button the Configuration Utility stores the parameters in your computer's registry as well and automatically retrieves them when you restart the Configuration Utility, even if the controller is not connected.

The **Configuration Utility** includes an input monitor function for both sensors, where a dot is travelling along the sensitivity and curve indicates the sensor input. The monitor is controlled by the **Enable Monitor/Disable Monitor** button. In the MAC version you can play your keyboard while you monitor the breath input. Due to limitations in Windows this is unfortunately not possible and therefore you have to disable the Breath Controller in your sequencer.

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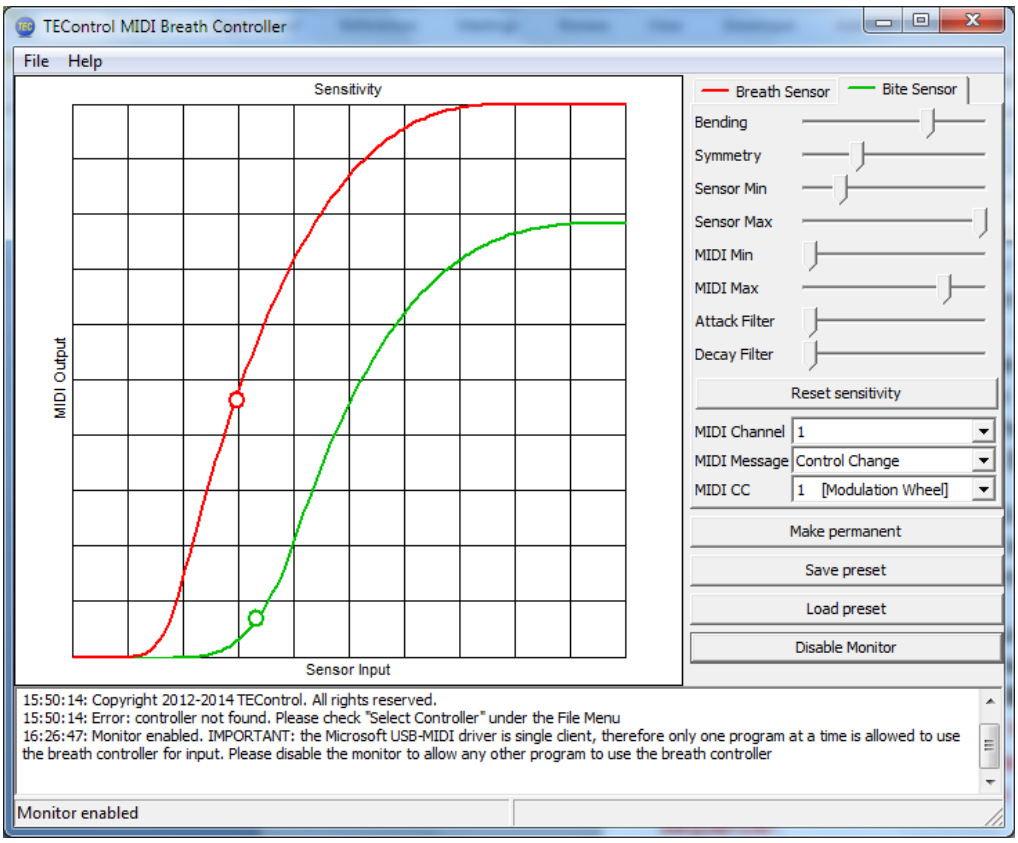

Figure 3 - Monitoring function

6 COMPATIBILITY

6.1 Sample Libraries

Compatibility has been verified with the following sample libraries:

8DIO - Adagio violas. Beautiful, beautiful!

AudioBro LA Scoring Strings LASS - Excellent results can be achieved by controlling the Kontakt player ModWheel or Expression with MIDI Breath Controller CC data.

East West Quantum Leap (EWQL) - East West Play Software is easily controlled by the BBC by using e.g. ModWheel or Expression CC data.

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Orchestration Tools. We have tested the Berlin Woodwinds and it works fantastically well.

ProjectSam - Both Symphobia 1 & 2 and True Strike 1 & 2 use the Kontakt player and works beautifully with the MIDI Breath Controller.

Sample*modeling* - We have tested the Trumpet (Kontakt based) and the Clarinet (SWAM based). It's a marriage made in heaven!

SpectraSonics - The MIDI Breath Controller works great with Omnisphere, Trilian and Stylus RMX.

Spitfire Albion - This library uses the Kontakt player from Native Instrument and is easily controlled from the MIDI Breath Controller through ModWheel or Expression CC data.

Vienna Symphonic Library (VSL) - The Vienna Instrument PRO has itself extensive capabilities of routing any CC data to appropriate parameters as well as a fully configurable sensitivity curve. The MIDI Breath Controller works wonderfully with e.g EPIC horns.

Wallander Instruments - A perfect match! All their instruments sounds incredible and are easily controlled with the Breath Controller.

6.2 Sample players

EastWest's Play engine

Kontakt player from Native Instruments

Vienna Instrument Pro from VSL

As we are continuing expanding this list, please, refer to our website for the latest updates.

We have not found any sample player incompatible with the BBC. There are of course many left to be tested and although TEControl cannot guarantee compatibility there is no reason to believe the BBC isn't compatible with all of them assuming they all comply with the MIDI standards. Concerning direct

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connection of the BBC to a keyboard/synthesizer, please, refer to our website for latest compatibility updates.

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7 CONTROL CHANGE NUMBERS

The following table lists all currently defined **Control Change** messages and **Channel Mode** messages, in control number order. (Adopted from "MIDI by the Numbers" by D. Valenti-Electronic Musician 2/88, updated by the MIDI Manufacturers Association.)

Registered Parameter Numbers (RPNs) are an extension to the Control Change message for setting additional parameters. Appended at the bottom is a table of all currently defined RPNs.

Control Changes and Mode Changes (Status Bytes 176-191)					
Control Number (2nd Byte Value)			**Control Function**	**3rd Byte Value**	
Dec	**Binary**	**Hex**		**Value**	**Used As**
0	00000000	00	Bank Select	0-127	MSB
1	00000001	01	Modulation Wheel or Lever	0-127	MSB
2	00000010	02	Breath Controller	0-127	MSB
3	00000011	03	Undefined	0-127	MSB
4	00000100	04	Foot Controller	0-127	MSB
5	00000101	05	Portamento Time	0-127	MSB
6	00000110	06	Data Entry MSB	0-127	MSB
7	00000111	07	Channel Volume (formerly Main Volume)	0-127	MSB
8	00001000	08	Balance	0-127	MSB
9	00001001	09	Undefined	0-127	MSB
10	00001010	0A	Pan	0-127	MSB
11	00001011	0B	Expression Controller	0-127	MSB
12	00001100	0C	Effect Control 1	0-127	MSB
13	00001101	0D	Effect Control 2	0-127	MSB
14	00001110	0E	Undefined	0-127	MSB
15	00001111	0F	Undefined	0-127	MSB
16	00010000	10	General Purpose Controller 1	0-127	MSB
17	00010001	11	General Purpose Controller 2	0-127	MSB

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18	00010010	12	General Purpose Controller 3	0-127	MSB
19	00010011	13	General Purpose Controller 4	0-127	MSB
20	00010100	14	Undefined	0-127	MSB
21	00010101	15	Undefined	0-127	MSB
22	00010110	16	Undefined	0-127	MSB
23	00010111	17	Undefined	0-127	MSB
24	00011000	18	Undefined	0-127	MSB
25	00011001	19	Undefined	0-127	MSB
26	00011010	1A	Undefined	0-127	MSB
27	00011011	1B	Undefined	0-127	MSB
28	00011100	1C	Undefined	0-127	MSB
29	00011101	1D	Undefined	0-127	MSB
30	00011110	1E	Undefined	0-127	MSB
31	00011111	1F	Undefined	0-127	MSB
32	00100000	20	LSB for Control 0 (Bank Select)	0-127	LSB
33	00100001	21	LSB for Control 1 (Modulation Wheel or Lever)	0-127	LSB
34	00100010	22	LSB for Control 2 (Breath Controller)	0-127	LSB
35	00100011	23	LSB for Control 3 (Undefined)	0-127	LSB
36	00100100	24	LSB for Control 4 (Foot Controller)	0-127	LSB
37	00100101	25	LSB for Control 5 (Portamento Time)	0-127	LSB
38	00100110	26	LSB for Control 6 (Data Entry)	0-127	LSB
39	00100111	27	LSB for Control 7 (Channel Volume, formerly Main Volume)	0-127	LSB
40	00101000	28	LSB for Control 8 (Balance)	0-127	LSB
41	00101001	29	LSB for Control 9 (Undefined)	0-127	LSB
42	00101010	2A	LSB for Control 10 (Pan)	0-127	LSB
43	00101011	2B	LSB for Control 11 (Expression Controller)	0-127	LSB
44	00101100	2C	LSB for Control 12 (Effect control 1)	0-127	LSB
45	00101101	2D	LSB for Control 13 (Effect control 2)	0-127	LSB
46	00101110	2E	LSB for Control 14 (Undefined)	0-127	LSB
47	00101111	2F	LSB for Control 15 (Undefined)	0-127	LSB
48	00110000	30	LSB for Control 16 (General Purpose Controller 1)	0-127	LSB
49	00110001	31	LSB for Control 17 (General Purpose Controller 2)	0-127	LSB
50	00110010	32	LSB for Control 18 (General Purpose Controller 3)	0-127	LSB
51	00110011	33	LSB for Control 19 (General Purpose Controller 4)	0-127	LSB

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52	00110100	34	LSB for Control 20 (Undefined)	0-127	LSB
53	00110101	35	LSB for Control 21 (Undefined)	0-127	LSB
54	00110110	36	LSB for Control 22 (Undefined)	0-127	LSB
55	00110111	37	LSB for Control 23 (Undefined)	0-127	LSB
56	00111000	38	LSB for Control 24 (Undefined)	0-127	LSB
57	00111001	39	LSB for Control 25 (Undefined)	0-127	LSB
58	00111010	3A	LSB for Control 26 (Undefined)	0-127	LSB
59	00111011	3B	LSB for Control 27 (Undefined)	0-127	LSB
60	00111100	3C	LSB for Control 28 (Undefined)	0-127	LSB
61	00111101	3D	LSB for Control 29 (Undefined)	0-127	LSB
62	00111110	3E	LSB for Control 30 (Undefined)	0-127	LSB
63	00111111	3F	LSB for Control 31 (Undefined)	0-127	LSB
64	01000000	40	Damper Pedal on/off (Sustain)	≤63 off, ≥64 on	---
65	01000001	41	Portamento On/Off	≤63 off, ≥64 on	---
66	01000010	42	Sostenuto On/Off	≤63 off, ≥64 on	---
67	01000011	43	Soft Pedal On/Off	≤63 off, ≥64 on	---
68	01000100	44	Legato Footswitch	≤63 Normal, ≥64 Legato	---
69	01000101	45	Hold 2	≤63 off, ≥64 on	---
70	01000110	46	Sound Controller 1 (default: Sound Variation)	0-127	LSB
71	01000111	47	Sound Controller 2 (default: Timbre/Harmonic Intens.)	0-127	LSB
72	01001000	48	Sound Controller 3 (default: Release Time)	0-127	LSB
73	01001001	49	Sound Controller 4 (default: Attack Time)	0-127	LSB
74	01001010	4A	Sound Controller 5 (default: Brightness)	0-127	LSB
75	01001011	4B	Sound Controller 6 (default: Decay Time - see MMA RP-021)	0-127	LSB
76	01001100	4C	Sound Controller 7 (default: Vibrato Rate - see MMA RP-021)	0-127	LSB
77	01001101	4D	Sound Controller 8 (default: Vibrato Depth - see MMA RP-021)	0-127	LSB
78	01001110	4E	Sound Controller 9 (default: Vibrato Delay - see MMA RP-021)	0-127	LSB
79	01001111	4F	Sound Controller 10 (default undefined - see MMA RP-021)	0-127	LSB

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80	01010000	50	General Purpose Controller 5	0-127	LSB
81	01010001	51	General Purpose Controller 6	0-127	LSB
82	01010010	52	General Purpose Controller 7	0-127	LSB
83	01010011	53	General Purpose Controller 8	0-127	LSB
84	01010100	54	Portamento Control	0-127	LSB
85	01010101	55	Undefined	---	---
86	01010110	56	Undefined	---	---
87	01010111	57	Undefined	---	---
88	01011000	58	High Resolution Velocity Prefix	0-127	LSB
89	01011001	59	Undefined	---	---
90	01011010	5A	Undefined	---	---
91	01011011	5B	Effects 1 Depth (default: Reverb Send Level - see MMA RP-023) (formerly External Effects Depth)	0-127	---
92	01011100	5C	Effects 2 Depth (formerly Tremolo Depth)	0-127	---
93	01011101	5D	Effects 3 Depth (default: Chorus Send Level - see MMA RP-023) (formerly Chorus Depth)	0-127	---
94	01011110	5E	Effects 4 Depth (formerly Celeste [Detune] Depth)	0-127	---
95	01011111	5F	Effects 5 Depth (formerly Phaser Depth)	0-127	---
96	01100000	60	Data Increment (Data Entry +1) (see MMA RP-018)	N/A	---
97	01100001	61	Data Decrement (Data Entry -1) (see MMA RP-018)	N/A	---
98	01100010	62	Non-Registered Parameter Number (NRPN) - LSB	0-127	LSB
99	01100011	63	Non-Registered Parameter Number (NRPN) - MSB	0-127	MSB
100	01100100	64	Registered Parameter Number (RPN) - LSB*	0-127	LSB
101	01100101	65	Registered Parameter Number (RPN) - MSB*	0-127	MSB
102	01100110	66	Undefined	---	---
103	01100111	67	Undefined	---	---
104	01101000	68	Undefined	---	---
105	01101001	69	Undefined	---	---
106	01101010	6A	Undefined	---	---
107	01101011	6B	Undefined	---	---
108	01101100	6C	Undefined	---	---
109	01101101	6D	Undefined	---	---
110	01101110	6E	Undefined	---	---
111	01101111	6F	Undefined	---	---

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112	01110000	70	Undefined	---	---
113	01110001	71	Undefined	---	---
114	01110010	72	Undefined	---	---
115	01110011	73	Undefined	---	---
116	01110100	74	Undefined	---	---
117	01110101	75	Undefined	---	---
118	01110110	76	Undefined	---	---
119	01110111	77	Undefined	---	---
Note:	Controller numbers 120-127 are reserved for Channel Mode Messages, which rather than controlling sound parameters, affect the channel's operating mode. (See also Table 1.)				
120	01111000	78	[Channel Mode Message] All Sound Off	0	---
121	01111001	79	[Channel Mode Message] Reset All Controllers (See MMA RP-015)	0	---
122	01111010	7A	[Channel Mode Message] Local Control On/Off	0 off, 127 on	---
123	01111011	7B	[Channel Mode Message] All Notes Off	0	---
124	01111100	7C	[Channel Mode Message] Omni Mode Off (+ all notes off)	0	---
125	01111101	7D	[Channel Mode Message] Omni Mode On (+ all notes off)	0	---
126	01111110	7E	[Channel Mode Message] Mono Mode On (+ poly off, + all notes off)	Note: This equals the number of channels, or zero if the number of channels equals the number of voices in the receiver.	---
127	01111111	7F	[Channel Mode Message] Poly Mode On (+ mono off, +all notes off)	0	---

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8 DECLARATION OF CONFORMITY

Declaration of Conformity

Supplier's Name: **TEControl**

Supplier's Address: **Ragnarsv. 2, 23192 Trelleborg, Sweden**

Supplier's email: info@tecontrol.se

declares that the product **USB Midi Breath & Bite Controller** conforms to the following

EMC:
EN 55022:2010
EN 55024:2010

RoHS:
EN 50581:2012

The product herewith complies with the requirements of the RoHS Directive 2011/65/EU, the EMC Directive 2004/108/EC and carries the CE marking accordingly.

Trelleborg, 19.07.2014

Owner, TEControl

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